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# Rhodora

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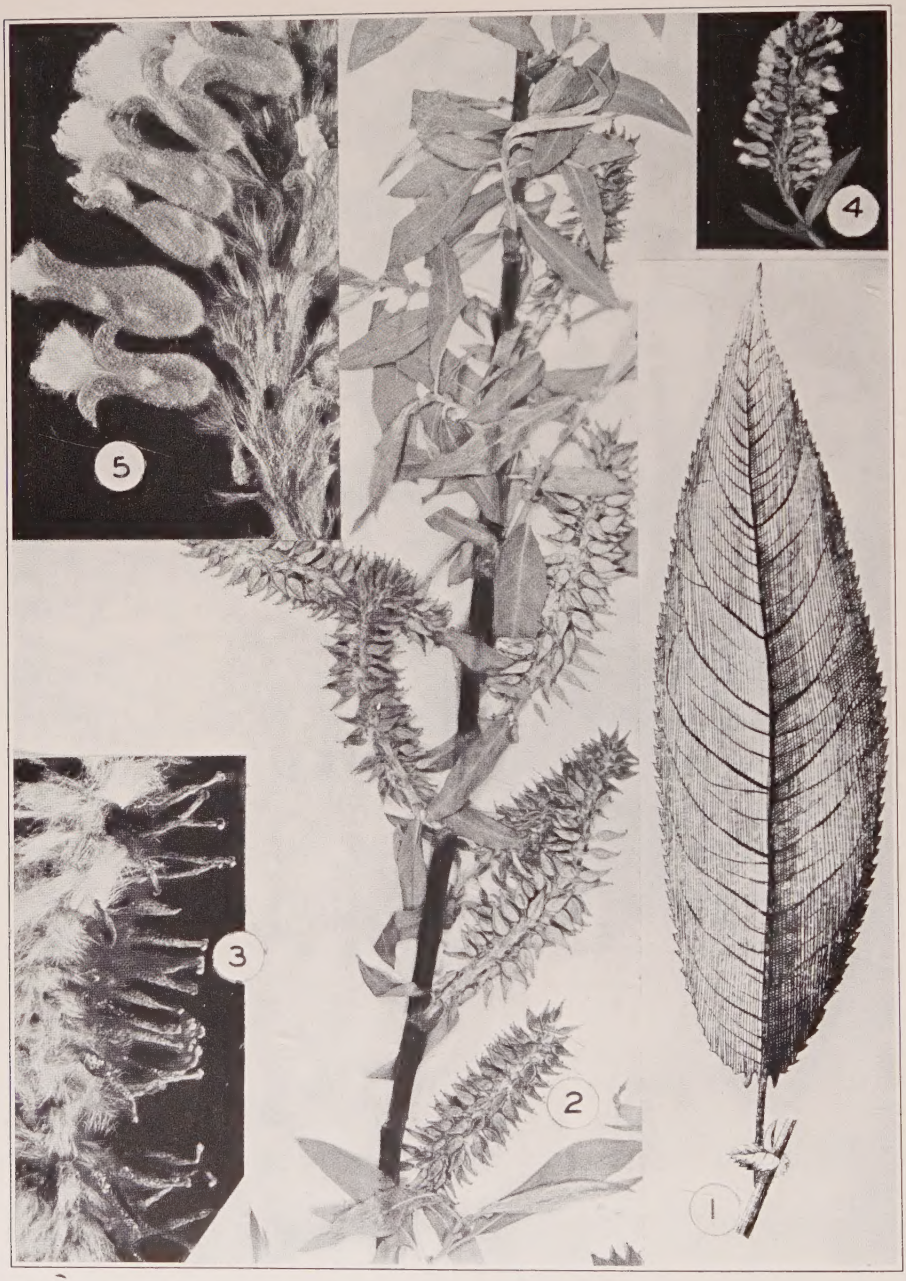


*Photo. B. G. Schubert*

SALIX RIGIDA: FIG. 1, leaf of TYPE, × 1, after *Muhlenberg;* FIG. 2, fruiting branch, × 1; FIG. 3, portion of young pistillate ament, × 5; FIG. 4, fruiting ament, × ⅘; FIG. 5, portion of fruiting ament, × 5.

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JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 48. February, 1946. No. 566.


## NINTH REPORT OF THE COMMITTEE ON PLANT DISTRIBUTION

The present report deals with the tribes *Chlorideae*, *Festuceae* and *Hordeae* of the *Gramineae*, taken in the order of the seventh edition of Gray's Manual. This report completes the treatment of the *Gramineae* which has continued through two previous reports with which it has been prepared more or less concomitantly; acknowledgments there made apply equally here.

## PRELIMINARY LISTS OF NEW ENGLAND PLANTS—XXXIV

The sign + indicates that an herbarium specimen has been seen: the sign − that a reliable printed record has been found.

| | Me. | N. H. | Vt. | Mass. | R. I. | Conn. |
|---|---|---|---|---|---|---|
| I. Chlorideae | | | | | | |
| Bouteloua curtipendula (Michx.) Torr. | + | | | + | | + |
| Bouteloua gracilis (HBK.) Lag. | + | | | + | | |
| Bouteloua radicosa (Fourn.) Griffiths | + | | | + | | |
| Bouteloua rigidiseta (Steud.) Hitchc. | + | | | + | | |
| Bouteloua simplex Lag. | + | | | | | |
| Chloris cucullata Bisch. | + | | | | | |
| Chloris virgata Swartz | + | | | + | | |
| Cynodon dactylon (L.) Pers. | | | | + | | + |
| Dactyloctenium aegyptium (L.) Richter | + | | | + | | |
| Eleusine indica (L.) Gaertn. | | | | + | + | + |
| Leptochloa filiformis (Lam.) Beauv. | | | | + | | |
| Spartina alterniflora Loisel. | + | + | | + | + | + |
| Spartina alterniflora var. pilosa (Merr.) Fern. | + | + | | + | + | + |
| Spartina caespitosa A. A. Eaton | + | + | | + | + | + |
| Spartina cynosuroides (L.) Roth | | | | + | | + |
| Spartina patens (Ait.) Muhl. | + | + | | + | + | + |
| Spartina patens var. juncea (Michx.) Hitchc. | + | + | | + | + | + |

| | Me. | N. H. | Vt. | Mass. | R. I. | Conn. |
|---|---|---|---|---|---|---|
| II. Chlorideae—*Cont.* | | | | | | |
| Spartina pectinata Link | + | + | + | + | + | + |
| Spartina pectinata var. Suttiei (Farwell) Fern. | + | + | + | + | | + |
| II. Festuceae | | | | | | |
| Briza media L. | | | + | + | | + |
| Briza minor L. | + | | + | + | + | + |
| Bromus arvensis L. | | | + | + | | + |
| Bromus brizaeformis Fisch. & May. | | | − | + | | + |
| Bromus ciliatus L. | + | + | + | + | + | + |
| Bromus ciliatus var. intonsus Fern. | + | + | + | + | + | + |
| Bromus commutatus Schrad. | + | | | + | + | + |
| Bromus Dudleyi Fern. | + | + | + | + | + | + |
| Bromus erectus Huds. | + | | + | | | + |
| Bromus inermis Leyss. | + | + | + | + | | + |
| Bromus inermis f. aristatus (Schur.) Fern. | + | | | + | | + |
| Bromus japonicus Thunb. | | | | + | | + |
| Bromus Kalmii Gray | + | + | + | + | | + |
| Bromus latiglumis (Shear) Hitchc. | + | + | + | + | | + |
| Bromus latiglumis f. incanus (Shear.) Fern. | + | + | + | + | | + |
| Bromus marginatus Nees | + | | | | | + |
| Bromus marginatus var. seminudus Shear | + | | | | | |
| Bromus mollis L. | + | | | + | + | + |
| Bromus mollis f. leiostachys (Hartm.) Fern. | | | | | | + |
| Bromus purgans L. | | − | + | + | + | + |
| Bromus purgans f. glabriflorus Wieg. | | | − | | | + |
| Bromus purgans f. laevivaginatus Wieg. | | + | + | + | | + |
| Bromus racemosus L. | + | | − | + | + | + |
| Bromus rigidus Roth var. Gussonii (Parl.) Coss. & Dur. | | | | + | | |
| Bromus rubens L. | | | | + | | |
| Bromus secalinus L. | + | + | + | + | + | + |
| Bromus sterilis L. | | | | + | + | + |
| Bromus squarrosus L. | | | | | | + |
| Bromus tectorum L. | + | + | + | + | + | + |
| Cynosurus cristatus L. | + | + | + | + | + | + |
| Dactylis glomerata L. | + | + | + | + | + | + |
| Dactylis glomerata var. ciliata Peterm. | + | + | + | + | + | + |
| Dactylis glomerata var. detonsa Fries | + | + | | + | + | + |
| Dactylis glomerata var. vivipara (Lange) Carpenter | | | + | | | |
| Diplachne maritima Bickn. | | + | | + | + | + |
| Diplachne uninervia (Presl) Parodi | | | | + | | |
| Distichlis spicata (L.) Greene | + | + | | + | + | + |
| Eragrostis capillaris (L.) Nees | + | + | + | + | + | + |
| Eragrostis Frankii C. A. Mey. | | + | + | + | | + |
| Eragrostis hypnoides (Lam.) BSP. | + | + | + | + | | + |
| Eragrostis intermedia Hitchc. | | | | + | | |
| Eragrostis megastachya (Koel.) Link | + | + | + | + | + | + |
| Eragrostis multicaulis Steud. | + | + | + | + | | + |
| Eragrostis pectinacea (Michx.) Nees | + | + | + | + | + | + |
| Eragrostis pilosa (L.) Beauv. | | + | | + | | + |
| Eragrostis poaeoides Beauv. | | | + | + | | + |
| Eragrostis spectabilis (Pursh) Steud. | | + | | + | | + |

| II. Festuceae—*Cont.* | Me. | N. H. | Vt. | Mass. | R. I. | Conn. |
|---|---|---|---|---|---|---|
| Eragrostis spectabilis var. sparsihirsuta Farwell | + | + | + | + | + | + |
| Festuca capillata Lam. | + | + | + | + | + | + |
| Festuca elatior L. | + | + | + | + | + | + |
| Festuca obtusa Spreng. | + | + | + | + | + | + |
| Festuca ovina L. | + | + | + | + | + | + |
| Festuca ovina var. duriuscula (L.) Koch | | | − | + | | + |
| Festuca ovina f. hispidula (Hack.) Holmb. | | | − | + | | + |
| Festuca prolifera (Piper) Fern. | + | + | | | | |
| Festuca rubra L. | + | + | + | + | + | + |
| Festuca rubra var. commutata Gaud. | + | + | | + | + | + |
| Festuca rubra f. megastachys (Gaud.) Holmb. | + | | | + | | + |
| Festuca rubra var. multiflora (Hoffm.) Asch. & Graeb. | + | | | + | | |
| Festuca rubra f. squarrosa (Fries) Holmb. | | + | + | + | | + |
| Festuca rubra var. trichophylla Gaud. | | + | | | | |
| Festuca saximontana Rydb. | | | + | | | |
| Glyceria acutiflora Torr. | + | + | + | + | + | + |
| Glyceria borealis (Nash) Batchelder | + | + | + | + | + | + |
| Glyceria canadensis (Michx.) Trin. | + | + | + | + | + | + |
| Glyceria Fernaldii (Hitchc.) St. John | + | + | + | + | | + |
| Glyceria fluitans (L.) R. Br. | | | | + | | |
| Glyceria grandis Wats. | + | + | + | + | + | + |
| Glyceria grandis f. pallescens Fern. | + | | | | | + |
| Glyceria laxa Scribn. | + | + | | + | | + |
| Glyceria melicaria (Michx.) Hubb. | + | + | + | + | + | + |
| Glyceria obtusa (Muhl.) Trin. | + | + | | + | + | + |
| Glyceria pallida (Torr.) Trin. | + | + | | + | + | + |
| Glyceria septentrionalis Hitchc. | + | + | | + | + | + |
| Glyceria striata (Lam.) Hitchc. | + | + | + | + | + | + |
| Glyceria striata var. stricta (Scribn.) Fern. | + | + | + | + | | |
| Molinia caerulea (L.) Moench. | + | | + | | | + |
| Pappophorum mucronulatum Nees | + | | | | | |
| Phragmites communis Trin. var. Berlandieri (Fournier) Fern. | + | | + | + | + | + |
| Poa alpigena (Fries) Lindm. f. | + | + | | | | |
| Poa alsodes Gray | + | + | + | + | | + |
| Poa angustifolia L. | + | + | + | + | + | + |
| Poa annua L. | + | + | + | + | + | + |
| Poa Chapmaniana Scribn. | | | | + | | |
| Poa compressa L. | + | + | + | + | + | + |
| Poa glauca Vahl | + | + | + | | | |
| Poa languida Hitchc. | | | − | + | + | + |
| Poa laxa Haenke | + | + | + | | | |
| Poa nemoralis L. | + | + | + | + | + | + |
| Poa nemoralis var. glaucantha (Gaud.) Reichenb. | | | | | | + |
| Poa palustris L. | + | + | + | + | + | + |
| Poa pratensis L. | + | + | + | + | + | + |
| Poa saltuensis Fern. & Wieg. | + | + | + | + | | + |
| Poa saltuensis var. microlepis Fern. & Wieg. | + | + | | | | |

| | Me. | N. H. | Vt. | Mass. | R. I. | Conn. |
|---|---|---|---|---|---|---|
| II. FESTUCEAE—*Cont.* | | | | | | |
| Poa sylvestris Gray | | | − | | | |
| Poa trivialis L. | + | + | − | + | + | + |
| Puccinellia distans (L.) Parl. | + | | + | + | | + |
| Puccinellia distans var. angustifolia (Blytt) Holmb. | | | | + | | |
| Puccinellia fasciculata (Torr.) Bickn. | + | | | + | + | + |
| Puccinellia maritima (Huds.) Parl. | + | + | | + | + | |
| Puccinellia Nuttalliana (Schult.) Hitchc. | + | | + | | | |
| Puccinellia paupercula (Holm) Fern. & Weath. var. alaskana (Scribn. & Merr.) Fern. & Weath. | + | + | | + | + | + |
| Schizachne purpurascens (Torr.) Swall. | + | + | + | + | + | + |
| Schizachne purpurascens f. albicans Fern. | + | + | | | | + |
| Scleropoa rigida (L.) Griseb. | | | | + | + | |
| Triodia flava (L.) Smyth | | + | + | + | + | + |
| Triplasis purpurea (Walt.) Chapm. | + | + | | + | + | + |
| Vulpia megalura (Nutt.) Rydb. | + | | | | | |
| Vulpia myurus (L.) K. C. Gmel. | + | | | + | + | |
| Vulpia octoflora (Walt.) Rydb. var. tenella (Willd.) Fern. | + | + | + | + | + | + |
| III. HORDEAE | | | | | | |
| Agropyron pungens (Pers.) R. & S. | + | | | + | | |
| Agropyron repens (L.) Beauv. | + | + | + | + | + | + |
| Agropyron repens f. aristatum (Schum.) Holmb. | + | + | + | + | + | + |
| Agropyron repens f. pilosum (Scribn.) Fern. | + | + | | + | | + |
| Agropyron repens var. subulatum (Schreb.) Reichenb. | + | + | + | + | + | + |
| Agropyron repens var. subulatum f. heberhachis Fern. | + | | | + | + | |
| Agropyron repens var. subulatum f. setiferum Fern. | + | + | + | + | | + |
| Agropyron repens var. subulatum f. Vaillantianum (Wulf. & Schreb.) Fern. | + | + | + | + | + | + |
| Agropyron repens f. trichorrhachis Rohlena | + | + | − | + | | + |
| Agropyron Smithii Rydb. | | + | | | | |
| Agropyron trachycaulum (Link) Malte var. glaucum (Pease & Moore) Malte | + | + | + | + | | + |
| Agropyron trachycaulum var. majus (Vasey) Fern. | + | + | + | | | |
| Agropyron trachycaulum var. novae-angliae (Scribn.) Fern. | + | + | + | + | + | + |
| Elymus arenarius L. var. villosus E. Mey. | + | + | | + | | |
| Elymus canadensis L. | + | + | + | + | | + |
| Elymus canadensis f. glaucifolius (Muhl.) Fern. | | | + | + | + | + |
| Elymus caput-medusae L. | | | | | | + |
| Elymus riparius Wieg. | + | + | + | + | + | + |
| Elymus villosus Muhl. | | | + | + | + | + |
| Elymus villosus f. arkansanus (Scribn. & Ball) Fern. | | | + | + | | + |
| Elymus virginicus L. | + | + | + | + | + | + |

| III. Hordeae—*Cont.* | Me. | N. H. | Vt. | Mass. | R. I. | Conn. |
|---|---|---|---|---|---|---|
| Elymus virginicus f. hirsutiglumis (Scribn.) Fern. | + | + | + | + | + | + |
| Elymus virginicus var. glabriflorus (Vasey) Bush | | + | + | + | | + |
| Elymus virginicus f. australis (Scribn. & Ball) Fern. | | | + | + | + | + |
| Elymus virginicus var. halophilus (Bickn.) Wieg. | + | | | + | + | + |
| Elymus virginicus var. jejunus (Ramaley) Bush | + | | | | | |
| Elymus virginicus var. submuticus Hook. | | | | + | + | |
| Elymus Wiegandii Fern. | + | + | + | + | | + |
| Elymus Wiegandii f. calvescens Fern. | + | + | | + | | |
| Hordeum aegiceras L. | | | + | | | |
| Hordeum jubatum L. | + | + | + | + | + | + |
| Hordeum marinum Huds. | | | | + | | |
| Hordeum murinum L. | + | | | + | | + |
| Hordeum nodosum L. | + | | | + | | |
| Hordeum pusillum Nutt. | + | | | | | |
| Hordeum vulgare L. | + | + | + | + | + | + |
| Hordeum vulgare var. trifurcatum (Schlecht.) Alefeld | + | | | | | + |
| Hystrix patula Moench | + | + | + | + | + | + |
| Hystrix patula var. Bigeloviana (Fern.) Deam | + | + | + | + | + | + |
| Lolium multiflorum Lam. | + | + | − | + | + | + |
| Lolium multiflorum var. diminutum Mutel | + | + | + | + | | + |
| Lolium perenne L. | + | + | − | + | + | + |
| Lolium temulentum L. | + | | − | + | + | + |
| Lolium temulentum var. leptochaetum A. Br. | | | | + | | + |
| Nardus stricta L. | | + | | | | |
| Secale cereale L. | + | + | + | + | + | + |
| Triticum aestivum L. | + | + | − | + | + | + |

For an explanation of names in the above list which are not to be found in Gray's Manual, the following references may be consulted: Fernald, RHODORA XVIII. 177 and XXXV. 258 (*Spartina*); Fernald, RHODORA XXXII. 63 and XXXV. 316, Hitchcock, RHODORA VIII. 211, and Wiegand, RHODORA XXIV. 89 (*Bromus*); Fernald, RHODORA XXXV. 137 (*Dactylis*); Fernald, RHODORA XL. 108 (*Eragrostis multicaulis*); Hubbard, RHODORA XVIII. 235, Fernald, RHODORA XXXIV. 209, XXXV. 132 and XXXVII. 250 (*Festuca*); Fernald, RHODORA XL. 107 (*Vulpia*); St. John, RHODORA XIX. 75, Hubbard, RHODORA XIV. 186, and Fernald, RHODORA XXXI. 211 (*Glyceria*); Fernald, RHODORA XXXIV. 211 (*Phragmites*); Hubbard, RHODORA XVIII. 235 (*Poa palustris*); Fernald & Wiegand, RHODORA XX. 122 (*Poa saltuensis* and variety); Fernald & Weatherby, RHODORA XVIII.

1 (*Puccinellia*); Fernald, RHODORA XXX. 161 (*Agropyron*); Wiegand, RHODORA XX. 81, and Fernald, RHODORA XXXV. 187 (*Elymus*); Fernald, RHODORA XXIV. 229 (*Hystrix patula* var. *Bigeloviana* as *Asperella Hystrix* var. *Bigeloviana*). Additional names not given in Gray's Manual may be found in "Manual of the Grasses of the United States" by A. S. Hitchcock, Washington, 1935.

Geographically, the ranges of the groups here considered are well divided between northern and southern, as in our preceding report, (RHODORA XXXVIII. 263–271). The grasses in this list belong in geographic groups which have been used and defined in previous reports. As usual, varieties and forms which seem to have no geographic significance within our area are omitted. There are no strictly calcicolous representatives, nor are there grasses which have a range covering the region east of the Connecticut River only.

I. Generally distributed:—*Agropyron repens, Elymus virginicus, Glyceria canadensis, G. Fernaldii, G. grandis, G. striata, Poa angustifolia, P. palustris* and *P. pratensis.*

*Agropyron repens*, the familiar witchgrass of fields and gardens, seems not to have been extensively collected inland, perhaps because of its general abundance in settled areas; *Glyceria Fernaldii* has but one report from Cape Cod, none from Nantucket, Martha's Vineyard or Rhode Island, but has been collected at several stations in Connecticut, which is apparently near its southern limit of distribution.

*Poa alpigena* and *P. angustifolia* are generally merged in this country with an all-inclusive *P. pratensis* L. Professor Fernald supplies the following memorandum. "In both *P. pratensis* and *P. angustifolia* all or nearly all of the culms bear erect or strongly ascending tufts of new green leaves from the basal sheaths, whereas *P. alpigena* has the culms chiefly arising from among old dried leaves at the tips of last year's stolons, the basal leaf-tufts all or nearly all on separate prolonged stolons or offsets. In *P. pratensis* the soft to firm culms are compressed at base and often geniculate, 2–3 mm. thick at base; the basal leaves flat or flattish, as broad as the thickness of the culm; glumes lanceolate to ovate, nearly straight. *P. angustifolia* has the firm and erect culms terete at base, there 1–2 mm. thick; basal shoots with some

(often numerous) filiform to involute blades much more slender than the culm; glumes narrowly lanceolate, the second one arching. In both these species the lemma is copiously webbed at base, the intermediate nerves glabrous, but in *P. alpigena* the nerves are pubescent. The latter boreal species extends south to Newfoundland, the Magdalen Islands, Prince Edward Island, northern Maine, and the alpine region of Mount Washington, New Hampshire."

II. Rather general except in southeastern Massachusetts;—*Agropyron trachycaulum* var. *glaucum*, *Bromus ciliatus* var. *intonsus*, *Glyceria borealis*, *G. melicaria*, *Poa saltuensis*.

Southward *Glyceria borealis* extends to northern Rhode Island and Connecticut, but apparently is absent from the central and southern sections of these states. *Glyceria melicaria* is missing from Rhode Island and eastern Massachusetts, save for one station on the Merrimack River. *Poa saltuensis* is not present in southeastern New Hampshire, eastern Massachusetts or Rhode Island.

III. Northern A. (with numerous stations south of 43°): *Agropyron trachycaulum* var. *novae-angliae*, *Bromus ciliatus*, *Glyceria striata* var. *stricta*, *Poa nemoralis*.

IV. Northern B. (with not many stations south of 43°): *Agropyron trachycaulum* var. *majus*, *Poa glauca*, *P. saltuensis* var. *microlepis*.

*Agropyron trachycaulum* var. *majus* has been collected in Maine in the Katahdin and Kineo regions, in Washington County and sparingly westward along the coast; in New Hampshire at Northumberland, Woodstock and in the White Mountain Region; and in Vermont at Canaan. It is also reported in the Vermont Flora from Willoughby and scattered stations in the western part of the state.

V. Alpine: *Festuca prolifera*, *F. saximontana*, *Poa laxa*, *P. alpigena* (except in northern Maine).

*Festuca prolifera* has been collected on Mount Washington and Katahdin as has also *Poa laxa*. The latter also is found on Mount Mansfield. *Festuca saximontana* has been collected at Smuggler's Notch and *Poa alpigena* on Mount Washington.

VI. Neither northern Maine nor southeastern Massachusetts: *Elymus riparius*, *Festuca obtusa*, *Hystrix patula*, *H. patula* var. *Bigeloviana*.

*Elymus riparius*, as its name indicates, is a plant of river shores. *Festuca obtusa*, *Hystrix patula* and its variety are plants of rich mainly deciduous woods. None of these species extend east of the Kennebec valley. *Festuca obtusa*, in fact, has but one Maine station (Vassalboro). The absence of these species from northern and eastern Maine might give a false impression of the distribution of the species as a whole as *Hystrix* and *Festuca obtusa* are both found on North Mountain, Nova Scotia and in the St. John Valley, New Brunswick.

VII. Chiefly the three southern states:—*Bromus Kalmii*, *B. purgans*, *Elymus canadensis*, *E. villosus*, *Eragrostis capillaris*, *E. pectinacea*, *E. spectabilis*, *E. spectabilis* var. *sparsihirsuta*, *Glyceria acutiflora*, *G. pallida*, *G. septentrionalis*, *Poa languida*, *Triodia flava*, *Vulpia octoflora* var. *tenella*.

While these species are chiefly found in southern New England, some of them do extend into Maine, *Bromus Kalmii* reaching Oxford County, Maine, and *Elymus canadensis* reaching Maine, as well as northern New Hampshire and northern Vermont (also New Brunswick). Many of these species have also been collected in western Vermont. Several of these species are absent from western Massachusetts and from southeastern Massachusetts, Martha's Vineyard and Nantucket. These include *Bromus Kalmii*, *B. purgans*, *Elymus canadensis*, *E. villosus*, *Eragrostis capillaris*, *Poa languida*.

The typical smooth form of *Eragrostis spectabilis* has been collected at three stations in southern New Hampshire, at two in the Boston area, on Martha's Vineyard and Nantucket, and at Bridgeport, Connecticut. The variety *sparsihirsuta*, which is poorly named, since it is usually conspicuously hirsute, is extremely abundant and extends considerably further northward.

VIII. Western New England only:—*Eragrostis Frankii*, *E. hypnoides*. *Eragrostis hypnoides* occurs along Lake Champlain and Otter Creek in Vermont, near the Housatonic River in Western Massachusetts and Connecticut, and on the Connecticut River as far north as the Hanover region. There is a single station on the Stillwater River at Orono, Maine. *Eragrostis Frankii* is more restricted with stations at Manchester and Walpole, New Hampshire, Westminster, Vermont, and numerous stations along the lower Connecticut River and westward.

IX. Maritime (in the vicinity of the coast with no inland stations):—*Diplachne maritima, Distichlis spicata, Elymus arenarius* var. *villosus, E. virginicus* var. *halophilus, Puccinellia fasciculata, P. maritima, P. paupercula* var. *alaskana, Spartina alterniflora, S. alterniflora* var. *pilosa, S. caespitosa, S. cynosuroides, S. patens, S. patens* var. *juncea, Triplasis purpurea.*

*Diplachne maritima* is at Seabrook, New Hampshire, has one report from the Boston region, and is occasional from Falmouth and Nantucket, Massachusetts, westward along the coast. *Distichlis spicata* is common as far north as Cumberland County, Maine with outlying stations at Rockland and South Thomaston. *Elymus arenarius* var. *villosus* is a boreal species abundant on the Maine coast westward to Cape Elizabeth, with isolated stations at Hampton and Isles of Shoals, New Hampshire, Cape Ann and Provincetown, Massachusetts. *Puccinellia fasciculata* is known from Great Duck Island, Maine, Plum Island, Massachusetts, and from Cape Cod westward. *Puccinellia maritima* is more local, ranging from Newport, Rhode Island, to Casco Bay, Maine, with eastern outposts at Ocean Point and Isle au Haut. *Puccinellia paupercula* var. *alaskana,* a boreal species, is abundant westward to New Hampshire, and has isolated stations at Wellfleet, Hyannis, Gay Head and Cuttyhunk, Massachusetts, Westerly, Rhode Island, and Old Lyme, Connecticut. *Spartina caespitosa* is rather local, occurring from the Thames River, Connecticut, to Seabrook, New Hampshire, with a single station at South Thomaston, Maine. *Spartina cynosuroides* has been collected in Massachusetts at Salisbury, Nantucket, and Sandwich, Dennis and Brewster on Cape Cod; and at several stations from the mouth of the Connecticut River westward. *Spartina patens* var. *juncea* is common as far north as Plum Island, Massachusetts and Seabrook, New Hampshire. *Triplasis purpurea* is frequent northward to York, Maine.

X. Miscellaneous:—*Agropyron repens* var. *subulatum, Bromus Dudleyi, B. latiglumis, Festuca rubra, Glyceria laxa, G. obtusa, Phragmites communis* var. *Berlandieri, Spartina pectinata.*

*Agropyron repens* var. *subulatum,* while essentially a plant of seashore areas, also follows the rivers and sand plains inland. *Bromus Dudleyi,* an early blooming grass closely related to *B. ciliatus,* might be considered as belonging in the Northern A

group were it not for the fact that it seems to be absent from northern Maine and northern Vermont. Although it has been collected only at scattered stations it is often abundant where it does occur. *Bromus latiglumis* does not occur in southeastern Maine (east of the Kennebec River), in southeastern Massachusetts, or in Rhode Island. *Glyceria laxa*, a plant of moist soil, often flourishing in wet peat and wet glades of the Canadian type of forest, is frequent in Washington County, Maine, on Mount Desert, and in the Penobscot Bay region. It has also been collected at Milford, Monhegan and South Berwick, Maine, Wolfeboro and Hooksett, New Hampshire, Everett, Massachusetts, and Colebrook, Connecticut. *Glyceria obtusa* has the general range of a typical coastal plain species, save that it is apparently absent from Nantucket. There is no specimen available from that island, nor is it listed in Bicknell's Flora. It does occur, however, on the other outlying islands, Martha's Vineyard, the Elizabeth Islands and Block Island. *Phragmites communis* var. *Berlandieri* is abundant locally along the coast of Massachusetts, Rhode Island and Connecticut. There is no New Hampshire record, but there are scattered stations on the Maine coast as far east as Frankfort on the Penobscot River. Inland its distribution is erratic with scattered stations in northern Maine, western Vermont, western Massachusetts and Connecticut. *Spartina pectinata* is very abundant along the entire coast and occurs inland on sandy soil especially along lakes and rivers as far north as the St. Johns River in Maine, and Lakes Memphramagog and Champlain in Vermont. Naturally it is absent from mountainous regions.

There are a very large number of introduced grasses in the three tribes considered in this report. Many of these are waifs or casuals which have been found in vacant lots in cities and have appeared only once or twice. Wool waste has brought in many species. Others like the Festucas, *Lolium* and *Cynosurus* have come in with grass seed. Several of these grasses have become very persistent weeds, as in the case of *Bromus tectorum*, *Hordeum jubatum*, and in some cities, *Eleusine indica*.

The Boston region has produced a large number of these grasses, partly because of the extensive areas of unoccupied land, and partly because so many metropolitan botanists collected

extensively in these waste places, especially during the days when ballast was unloaded by incoming vessels.

Among the wool-waste plants are *Chloris elegans*, *C. cucullata*, the Boutelouas, and *Hordeum pusillum*.

R. C. Bean
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## CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY—NO. CLX

## TECHNICAL STUDIES ON NORTH AMERICAN PLANTS

M. L. Fernald

(*Continued from page 16*)

1. Salix eriocephala Michx. Fl. Bor.-Am. ii. 225 (1803) is represented by a good branch (except for broken leaf-tips) of the foliage "oblongo-ovalibus, basi subretusis, serrulatis", which my note of 1903 described "foliage of oblong-leaved *cordata*", and a flowering branch which clearly gave the name to the species, "S. diandra: ramulis minutim tomentosis: . . . amentis ovalibus, confertim villosissimis", "*Hab.* in regione Illinoensi", my note on it being "flowering branch near *discolor*". The type is material of the tomentulose-branched *S. missouriensis* Bebb in Garden and Forest, viii. 379 (1895). It has been erroneously placed with *S. discolor* as *S. discolor* Muhl., var. *eriocephala* (Michx.) Anderss. in DC. Prodr. xvi$^2$. 225 (1868), the very large precocious aments and long (up to 1 cm.) capsules having deceived those who did not consider its other characters, into thinking it *S. discolor*. Michaux's "foliis oblongo-ovalibus, basi subretusis" is not good for *S. discolor* which becomes relatively local in southern Illinois and adjacent eastern Missouri. Michaux collected his *S. eriocephala* "in regione Illinoensi". That meant southernmost Illinois, for Michaux went down the Ohio, camped at the mouth of the Wabash and then proceeded to the Mississippi near the mouth of the Ohio. Here *S. missouriensis* abounds ("Plants of the Lower Wabash Valley", Robt. Ridgeway, no. 1580), Ball explicitly referring to it "in Illinois along the Ohio River near its

junction with the Mississippi" (Ball in Deam, Shrubs Ind. 52), just the region where Michaux got his *S. eriocephala*. The very weak photograph which I got of the foliage of Michaux's type might almost as well have been taken from *Ridgway*, no. 1580 from the Lower Wabash, from Glatfelter's material from Crève Coeur, St. Louis Co., Missouri, or from *Ball & Over*, nos. 2233, 2235 and 2246 from South Dakota—these all characteristic broad-leaved representatives of *S. missouriensis*.

2. S. CORDATA Michx. l. c. (1803). This, although omitted from Index Kewensis, has nothing to do with the later published and generally more southern *S. cordata* Muhl. It was from Lake St. John, the entire treatment being

> CORDATA. S. ramulis foliisque villosis: foliis cordato-ovalibus, acuminatis, argute serrulatis; stipulis foliaceis, maximis. *HAB.* in Canada, ad lacum *S. Joannis*.

The shrub was very familiar to me when I studied Michaux's type, for only three years earlier I had been collecting it along the Aroostook River in northern Maine, hence my memorandum: "The most extreme broad-leaved pubescent form of the Aroostook R., once taken by me for *S. adenophylla* [with absolute correctness as it proves]." See later discussion.

3. S. INCANA Michx. l. c. (1803), not Schrank (1789). My memorandum accords with the long-held identification: "The true *candida* with flocculent pubescence. The spec. labelled 'Lac Mistassins et Riv. des Goelands'."

4. S. LONGIROSTRIS Michx. l. c. 226 (1803). My note says merely "One of the *tristis* forms". It is generally treated as *S. tristis* Ait. (1789).

5. S. CAROLINIANA Michx. l. c. (1803). Although *S. caroliniana* is commonly placed in the unquestioned synonymy of *S. nigra* Marsh., with which, in 1903, I was very familiar, I did not recognize the Michaux material of his *S. caroliniana*. Michaux identified it with the "*S. pentandra?*" of Walt. Fl. Carol. 243 (1788), which had "foliis glabris serratis nitidis lanceolatis" and which, if it at all resembled the Eurasian *S. pentandra* L., could not have looked very much like *S. nigra* Marsh., with, to quote Deam's Flora of Indiana, "leaves linear-lanceolate". Michaux's *S. caroliniana* was described as follows:

*Photo. B. G. Schubert*

SALIX RIGIDA (*S. cordata* Muhl.): FIG. 1, leaf of type of *S. cordata* Muhl., × 1, after *Muhlenberg;* FIGS. 2 and 3, staminate and pistillate flowering branches, × 1; FIG. 4, portion of fruiting ament, × 5.

*Photo. B. G. Schubert*

Salix cordata Michaux (*S. adenophylla* Hook.): fig. 1, type of *S. adenophylla*, × ca. ½; fig. 2, margin of leaf of type of *S. adenophylla*, × 10; figs. 3 and 4, leafy tip and fruiting ament, × ⅘, from probable type-region of *S. adenophylla*.

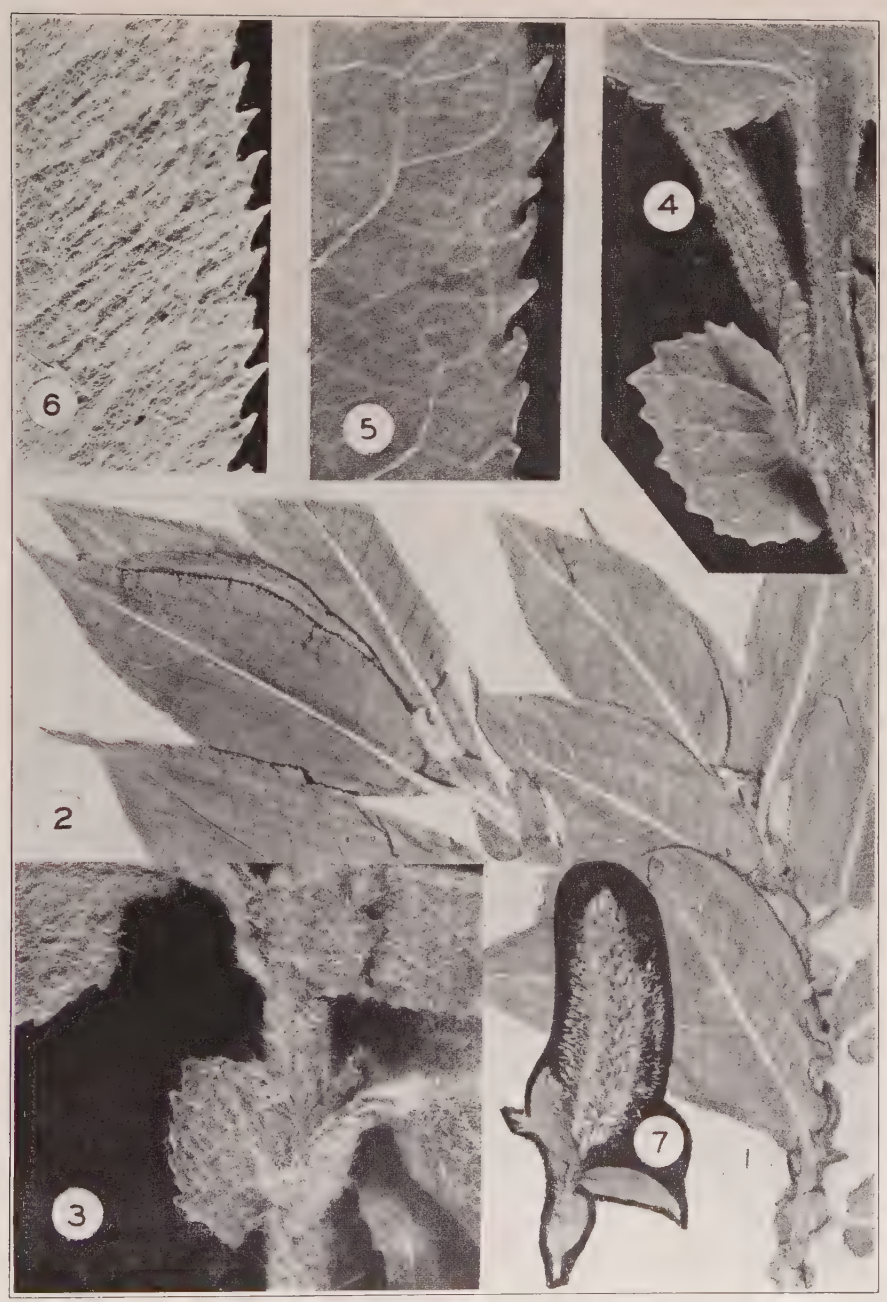


*Photo. B. G. Schubert*

SALIX CORDATA Michaux. FIGS. 1, 2, 3 and 6 from Michaux's TYPE-REGION: FIGS. 1 and 2, leafy tips, × ⅘; FIGS. 3 and 4, stipules and leaf-bases, × 5; FIGS. 5 and 6, leaf-margins, × 10; FIG. 7, staminate ament, × ⅘.

*Photo. B. G. Schubert*

SALIX CORDATA Michaux: FIG. 1, staminate flowering branch, × $\frac{4}{5}$; FIG. 2, pistillate flowering tip, × $\frac{4}{5}$; FIG. 3, fruiting ament, × $\frac{4}{5}$; FIG. 4, portion of young, and FIG. 5, portion of flowering staminate ament, showing blackish bracts, × 10.

*Photo. B. G. Schubert*

SALIX CORDATA Michaux: FIG. 1, fruiting branch, × 1; FIG. 2, lower surface of mature leaf, showing delicate venation, × 10; FIG. 3, portion of fruiting ament, showing short pedicels, × 10.

*Photo. B. G. Schubert*

SALIX SYRTICOLA: FIG. 1, pistillate, and FIG. 2, staminate branch, × 4/5, from TYPE.

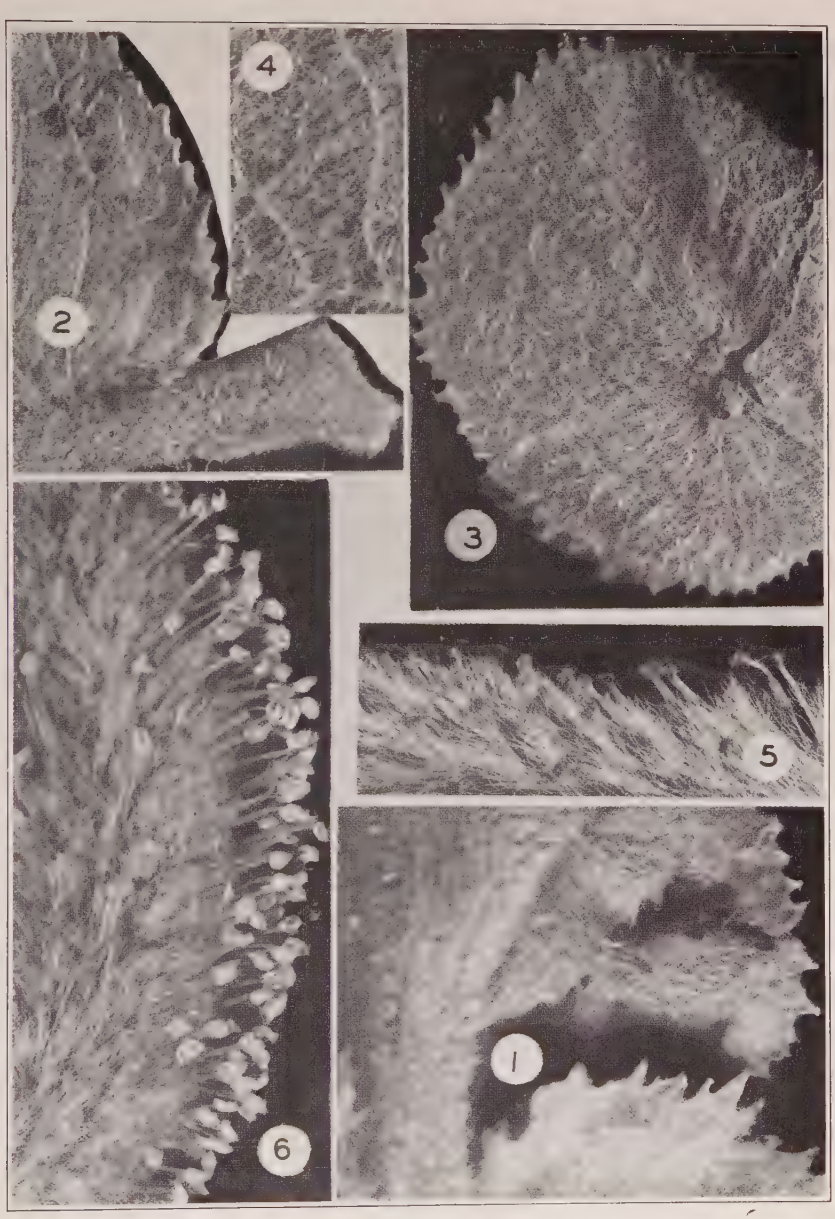


*Photo. B. G. Schubert*

SALIX SYRTICOLA: FIG. 1, portion of stipule, petiole and leaf-base, × 5; FIG. 2, petiole and leaf-base, × 5; FIG. 3, portion of stipule, × 5; FIG. 4, venation of lower leaf-surface, × 10; FIG. 5, portion of flowering pistillate ament, × 5; FIG. 6, portion of staminate ament, showing pale bracts, × 5, from TYPE.

*Photo. B. G. Schubert*

SALIX RETICULATA: FIG. 1, portion of staminate ament, × 10.
S. RETICULATA, var. SEMICALVA: FIG. 2, portion of TYPE, × 4/5; FIG. 3, staminate ament and lower surface of leaf, × 3, from TYPE; FIG. 4, portion of staminate ament, × 10, from TYPE.

CAROLINIANA. S. foliis lanceolatis, subtiliter arguteque serrulatis, subsessilibus: staminibus 4–6: amenti foeminei squamis oblongis, minutissime partimque lanuginosis; ovariis oblongis, glabris.

*S. pentandra* ? WALT.

*OBS.* Affinis *S. triandrae.*

*HAB.* in Carolina et Georgia.

In studying the American willows Schneider had before him the vast accumulations in all the larger American herbaria and it is significant that, with all these collections before him, he was unable to find any typical *S. nigra* from much of North and South Carolina and Georgia: "A very well-known eastern species the range of which seems to extend along the Atlantic coast from southern New Brunswick to northern North Carolina, and westward through northwestern South Carolina and northern Georgia (from where I have not yet seen typical material) to central and eastern Alabama . . . , southern Arkansas", etc. (Schneid. in Journ. Arn. Arb. i. 6 (1919)). In *S. nigra,* according to Sargent, Silva, ix. 104, "The stamens vary from three to five in number"; similarly, Andersson, the most accurate student ever to work on *Salix,* said in DC. Prodr. xvi². 200 (1868) "masc. 3–5-andris". Michaux's "4–6" slightly exceeds this and his "amenti foeminei squamis . . . partimque lanuginosis" is not too well described by Sargent's "scales . . . coated on the inner surface with pale hairs" nor by Andersson's "squamis in amentis . . . foemineis . . . glabriusculis vel basi et margine villosis".

In view of the great rarity in or absence from much of the area of "Carolina et Georgia" of *Salix nigra* and, likewise in view of Michaux's "*OBS.* Affinis *S. triandrae*", it would seem the obvious procedure to look for some common species of Carolina and Georgia which looks like the Eurasian *S. triandra* L. and which has 4 to 6 stamens, and the scales of the pistillate aments woolly at base. This is obviously *S. longipes* Shuttlew. ex Anders. (1868) and especially *S. Wardi* Bebb (1895), which Schneider treats as *S. longipes,* var. *Wardi* (Bebb.) Schneid. Typical *S. longipes* was recorded by Schneider in Journ. Arn. Arb. i. 25 et seq., "from Cuba to northern Florida . . . and from . . . adjacent southeastern Georgia . . . , South Carolina . . . , . . . eastern North Carolina . . . and in the southeastern corner of Virginia", the barely or hardly separable var. *Wardi* extending

to the District of Columbia "where it apparently reaches the most northern point of its distribution". One can hardly look at characteristic specimens of *S. triandra* without seeing marked resemblance in outline and breadth of leaves to those of *S. longipes* (including *S. Wardi*), but he would scarcely think of the more linear- and narrower-leaved *S. nigra*. Although Schneider in various papers talked around the subject, I fail to find him getting down to a concrete statement of the characters of *S. longipes* (and *Wardi*). Sargent's full description in his Silva, l. c. 107, of *S. Wardi* emphasizes "leaves lanceolate to ovate-lanceolate . . . or . . . linear-lanceolate . . . stamens . . . three to six", while *S. longipes* (as *S. occidentalis* Koch (1828), not Walt. (1788)) was defined with "leaves . . . lanceolate, . . . scales . . . oblong-obovate . . . and villous on the back . . . stamens five or six". Similarly, Ball, in his detailed description of *S. longipes* (including *Wardi*) in Deam's Shrubs of Indiana, 44, says "leaf-blades narrowly lanceolate to lanceolate, . . . scale oblanceolate or obovate, villous, . . . stamens 5–8". Assembling these modern statements and comparing with Michaux's we get for *S. longipes* (including *S. occidentalis* sensu Sargent and *S. Wardi*): leaves lanceolate (narrowly or broadly); scales of ament oblong-obovate or oblanceolate, villous on the back; stamens 3–8. Michaux said: leaves lanceolate; scales minutely and partly woolly; stamens 4–6; furthermore his *S. caroliniana* came from Carolina and Georgia, where *S. longipes* abounds and where *S. nigra* is rare or local.

Two more points. Quite unfamiliar with *Salix longipes* (*Wardi*) in 1903, I entered only a query against Michaux's *S. caroliniana*. This was "Form of *S. cordata?*". That was only an off-hand suggestion, but Bebb, who set up the species, *S. Wardi*, in Gard. and For. viii. 363 (1895), had originally published it as *S. nigra*, var. *Wardi* in Ward, Guide to Flora of Washington, 114 (1881). He then (1881) spoke of a form of the latter which "might be easily mistaken (in the absence of aments) for an extravagant growth of *S. cordata*". Again, in 1895, he wrote: "The statement made when this Willow was first described that in some of its forms the leaves alone, with their ample stipules, might easily be mistaken for *S. cordata*, finds striking exemplification in Professor Short's specimen in the Gray Herbarium, which

two no less competent salicologists than Mr. Carey[1] and Professor Andersson have mistaken for 'S. cordata angustata'. Indeed it is apparent from the description that this identical specimen served as the type of S. cordata angustata, 1° forma discolor, Andersson (DC., Prod. xvi². 252)." When the foliage of Michaux's type of *S. caroliniana* reminded my then quite inexperienced eye of that of *S. cordata* (surely not of *S. nigra*) I was in distinguished company, for it is an honor to approach the class with the discerning John Carey, the highest of honors to get near the limited group of most cautious salicologists with Nils Johan Andersson!

Schneider states with seeming finality regarding *Salix caroliniana* that "unfortunately no type specimen seems to exist in Michaux's herbarium at Paris"—Journ. Arn. Arb. iii. 64 (1921). But, from what I have already noted, it is evident that Schneider did not at all understand the types at Paris of Michaux's *S. eriocephala* and *S. cordata* and probably never studied them. These types and that of *S. caroliniana* were all there in 1903, when I studied and photographed some of them; of course, since the invasion of Paris by Hitler's ravaging hordes they may now be missing; but shortly before the "*blitzkrieg*" in which Paris was invaded at the opening of the recent war the TYPE was there, for Cintract took the photograph of it which is before me. This photograph shows the relatively broad young leaves paler beneath than above and the toothing of *Salix longipes*, not of *S. nigra*. I am satisfied that S. CAROLINIANA Michaux. (1803) is *S. longipes* Shuttlew. (1858), i. e. *S. Wardi* (Bebb) Bebb (1895).

S. CORDATA Michx. Fl. Bor.-Am. ii. 225 (early 1803); Poiret in Lam. Encycl. Méth. vi. 661 (1804); not Muhl. in Ges. Naturf. Freunde Neue Schr. iv. 236, t. 6, fig. 3 (late 1803 or early 1804). *S. adenophylla* Hook. Fl. Bor.-Am. ii. 146 (1839); Schneid. in Journ. Arn. Arb. i. 158 (1920) in part (excl. *S. syrticola*); St. John, Vict. Mem. Mus. Mem. **125:** 79 (1922); Raup in Sargentia, iv.

[1] In his Salices Amer. no. 22, Joseph Barratt had *Salix longipes* under a *nomen nudum* (in Index Kewensis and also cited by Schneider, so that I am not here publishing a useless name), with the following explanation: "22. *Salix Pitcheriana** Barratt, MSS. Hab. Arkansas.—Dr. Pitcher. Sea Islands of Georgia. This undescribed species is allied to *S. nigra*. I possess specimens which have been obligingly communicated by John Carey, Esq. of New York", etc. John Carey was not properly edified. On one of his labels of Georgia material he wrote: "I always supposed this to be S. nigra of Lin [who had no such species]: (no doubt it is of Ell.) but Dr. Barratt who calls himself the great authority for our willows names it a new species". "Authorities" beware!

111 (1943).—Southeastern Labrador Peninsula to James Bay, Ontario, south to Newfoundland, Nova Scotia, northern Maine, eastern Cape Cod, northern New York, Simcoe and Bruce Cos., Ontario, and northern Michigan. PLATES 997–1000.

*Salix cordata* Michx. has been wrongly guessed, ever since Willdenow, to be identical with the later *S. cordata* Muhl. (see pp. 14 and 28 and plates 995 and 996). In his Species Plantarum, iv$^2$. 666 (1806), Willdenow took up the later *S. cordata* Muhl., expanding Muhlenberg's original description to read "*ramis glabris viridibus.* Folia *tripollicaria oblongo-lanceolata acuminata basi cordata, margine argute serrata, serraturis cartilagineis, utrinque glabra*", etc.; and at the same time he maintained *S. rigida* Muhl. as a distinct species, although others have not been able to do so. *S. rigida* was thought to be distinguished by "*ramis viridibus superne purpurascentibus, junioribus pubescentibus.* Folia *tripollicaria rigida oblongo-lanceolata acuminata basi subcordata, margine argute serrata, serratura infime elongata apice glandulosa*" etc., not very convincing differences, especially when Muhlenberg's original figures (our PLATE 995, FIG. 1 and 996, FIG. 1) are compared. However, in *S. rigida*, with glabrous oblong-lanceolate subcordate leaves, Willdenow doubtfully included "S. (*cordata*) ramulis foliisque villosis, foliis cordato-ovalibus acuminatis argute serrulatis, stipulis foliaceis maximis. *Mich. amer.* 225?". There he had a really different species, which has positively cordate and narrowly oval or ovate leaves densely villous when young, and often to maturity, and coming originally from Lake St. John, which is more than 600 miles north of Muhlenberg's region (Lancaster County, Pennsylvania) and with a Hudsonian or Hudsonio-Canadian (instead of Allegheneian-Carolinian) flora. As stated on a previous page (28) the type of *S. cordata* Michx. from Lake St. John is surely of the northern species with densely pubescent branchlets and young foliage, which is common from southeastern Labrador Peninsula to James Bay, a species (PLATES 997–1000) of which many sheets from Lake St. John are before me. In its smallest-leaved developments it is quite identical with the type of *S. adenophylla* Hook. (PLATE 997, FIGS. 1 and 2) from "Labrador. *Dr. Morrison*", the latter region being presumably the Côte Nord of the eastern part of Saguenay County, Quebec, which in Hooker's (and Morrison's) time was included in "Labrador". At least the type of *S. adeno-*

*phylla* could perfectly well have come from the Natashquan River, the old "American Harbour," for Natashquan material (PLATE 997, FIGS. 3 and 4) is very like it. The photograph of Hooker's type of *S. adenophylla* was sent to the late Professor Sargent and is preserved, along with some leaves and portions of an ament at the Arnold Arboretum. In its details it is quite like specimens from Newfoundland, the Côte Nord, Lake St. John, Aroostook River, Maine, James Bay and elsewhere in the range of Michaux's species; and the photograph and fragments exactly agree with Hooker's detailed account of his *S. adenophylla:*

S. *S. adenophylla;* ramis brevibus subrobustis lanatis, foliis ovatis basi cordatis acutis subcoriaceis fere omnino sessilibus reticulatim venosis argute serratis serraturis elongatis glanduliferis lana sericea dense obsitis demum aetate nudiusculis, stipulis ovato-cordatis grosse glanduloso-serratis, amentis foemineis elongatis pedunculatis, capsulis ovatis acuminatis glaberrimis, stylo elongato, stigmatis lobis fissis.

HAB. Labrador. *Dr. Morrison.*—I know no species like this, well marked as it is by the copious long narrow serratures to the leaves tipped with a gland, so that the leaf looks as if it were fringed with pedicellated glands. These leaves are an inch or more long, clothed, even when fully grown, with long silky tomentum on both sides, but which is deciduous on the oldest leaves . . .

Although the teeth on young and just expanding leaves of *Salix cordata* Michx. (and *S. adenophylla*) may be prolonged and gland-tipped, they are often lower, blunter and less evidently ending in glands, in such specimens the toothing approaching that of *S. rigida* Muhl. (*S. cordata* Muhl.). Furthermore, the narrowest-leaved *S. cordata* resembles the broadest-leaved *S. rigida* but the blades are more generally cordate in the former than in the latter. Measurements of all mature foliage in the Gray Herbarium gives the following results, to which I add the far more significant characters of the aments.

S. CORDATA: leaves broadly oblong-lanceolate to ovate, mostly strongly cordate, the mature ones 3–13 (av. 6.5) cm. long and 2–5.5 (av. 3.5) cm. broad; staminate aments terminating leafy axillary branchlets, the leaves well developed at anthesis, the bracts with whitish beard; pistillate aments dense, in anthesis with appressed-ascending ovaries, in fruit with the capsules crowded on very short pedicels shorter than to barely exceeding the bracts.

S. RIGIDA: leaves oblong-lanceolate, subcordate, rounded or tapering or attenuate at base, the mature blades one eighth to one third as broad as long, 4.5–15 cm. long, 0.9–4.5 cm. broad; staminate aments subtended by short bracts barely expanded at anthesis; pistillate aments in anthesis with widely (often horizontally) divergent ovaries, in fruit with the widely divergent capsules on pedicels as long as to much longer than their subtending bracts.

Typical *Salix cordata* Michx. has heavily villous branchlets and young leaves, the pubescence inclined to persist on the mature foliage. In the eastern part of its range it is represented in many areas (along certain rivers, etc.) by a glabrous or glabrescent extreme, which has the aments, stamens, short pedicels and cordate leaf of the typical extreme of the species, but with the teeth less often prolonged and gland-tipped than in that shrub. With leaf-outline and aments of *S. cordata* and occurring only in Newfoundland, eastern Canada and northern Maine, mostly north of *S. rigida*, it seems to be an extreme of the northern species. This is

S. CORDATA Michx., var. **abrasa,** var. nov., ramulis petiolisque glabris vel glabratis; foliis costa excepta glabris vel glabratis.—Newfoundland and Gaspé Peninsula, Quebec, to Nova Scotia and northern Maine. The following are characteristic. NEWFOUNDLAND: Birchy Pond Stream, *Fernald & Wiegand*, no. 3149; Harry's River (or Brook), *Fernald & Wiegand*, no. 3150; Forcele-Plain, Harry's Brook, *R. B. Kennedy*, nos. 305 and 387; Riverview Camp, Grand Codroy River, *Pease & Edgerton*, no. 27,120. QUEBEC: R. Ste. Anne des Monts, Gaspé Co., July 14–17, 1906, *Fernald & Collins*, nos. 484 (TYPE in Herb. Gray.), 485 and 486; R. Petite Cascapedia, Bonaventure Co., *Victorin, Rolland & Jacques*, no. 33,845; Bonaventure R., Bonaventure Co., Aug. 4–8, 1904, *Collins, Fernald & Pease* (*Pease*, nos. 5831 and 5897); junction of Restigouche and Matapedia Rivers between Quebec and New Brunswick, *Rousseau & Boivin*, nos. 32,037 and 32,082; Grande-Décharge, Lac St.-Jean, *Victorin, Rolland & Meilleur*, no. 45,872. NEW BRUNSWICK: Tom's Island, Restigouche R., July 30, 1896, *G. U. Hay;* lower Tobique River, Oct., 1945, *G. D. Chamberlain*. NOVA SCOTIA: Salt Springs, Pictou Co., *Perry, Wetmore, Hicks & Prince*, no. 10,134; Truro, Colchester Co., *J. G. Jack*, no. 3633; Wellington, Shubenacadie Grand Lake, Halifax Co., *Fernald, Bartram & Long*, no. 23,739 (transitional); Landsdown, Digby Co., *J. G. Jack*, no. 3704. MAINE: Fort Kent, Aroostook Co., *Fernald*, nos. 2473–2475; *Pease*, no. 2578.

Schneider, who considered *Salix cordata* Muhl. and *S. cordata* Michx. identical and who put them both into § *Cordatae*, treated *S. adenophylla* Hook. (which is really very small-leaved *S. cordata* Michx.) as the type of a separate § *Adenophyllae*. He was unable to distinguish from the latter northern species the very different shrub of sands about Lake Michigan, *S. syrticola* Fernald in RHODORA, ix. 225 (1907), (our PLATES 1001 and 1002),

Schneider saying "Unfortunately Fernald did not see Hooker's type of which I have before me an excellent photograph and some fragments from the Kew Herbarium . . . When he proposed his new species he did not know of the specimens collected by Macoun, Ross and Spreadborough in the James Bay region. They connect the original habitat of (probably southern) Labrador and that of *S. syrticola*. The only difference between the forms of James Bay and those of the Great Lakes, so far as I can judge, is in the length of the styles, which measure about 1.5 mm. in typical *S. adenophylla*, while they rarely are longer than 1 mm. in *S. syrticola*"—Schneid. in Journ. Arn. Arb. i. 158, 159 (1920).

Now it so happens that, in 1903 (again in 1930) the author of *Salix syrticola* had closely studied Hooker's type of *S. adenophylla* and he has many times studied colonies of *S. adenophylla* in Newfoundland, Quebec and northern Maine. The type, from the northeastern and rather inhospitable limit of the specific range, was unusually small-leaved and heavily pubescent, but the characters of this species (as the earlier *S. cordata* Michx.) are shown in PLATES 997–1000. Whether *S. syrticola* is fully distinct from *S. cordata* it is too soon to assert with finality. In general the two are very different in many characters, but in northern Michigan and about the Lake Huron shores of Ontario some shrubs indicate possible transitions which are no more tangible than the "mongrels" into which other species of *Salix* regularly "spawn" (to quote Bailey's picturesque phrase) when they meet and cross. Until very recently we did not know good staminate aments and the plans to secure them last June from the type-region of the northern shrub, Lake St. John, or from northern Maine were thwarted by the erratic weather, when abnormally late frosts after an abnormally early opening of spring blighted the flowers or fruits as well as vegetative tips of many species occurring from eastern Canada to the Southeastern States. Most fortunately, however, in late June and early July, Fathers Dutilly and Lepage secured beautiful freshly flowering staminate, as well as pistillate, material near James Bay. This differs at once from *S. syrticola* in many characters. As to the staminate aments, they are borne at the tips of well developed leafy branchlets, the bracteal leaves very much more developed than are those of *S. syrticola* during anthesis, and the beard of the bracts is much whiter than the fuscous beard in *S. syrticola*.

These characters of the staminate aments, accompanied by parallel ones in the pistillate, and by different outline, toothing and reticulation of leaves, different toothing of stipules, etc., lead to the following statement of contrasts.

S. CORDATA: Leaves broadly lance-oblong to oblong-ovate, long-acuminate, gradually tapering from below or near the middle, the mature ones 3–13 cm. long; each margin with 25–90 (av. 55) forward-arching at first often gland-tipped but soon glandless mostly simple teeth; the mature petiole (2–) 5–35 (av. 13) mm. long; the mature lower surface with secondary veins slender and relatively low: mature and larger stipules with 0–22 (av. 14) gland-tipped or mostly glandless teeth on the longer margin; staminate aments on leafy branchlets, the leaves well-grown at anthesis; the blackish to brown bracts with white beard: pistillate aments in maturity 2–6 cm. long; bracts narrowly obovate, fuscous or brown, their bright white beard only slightly longer; ovaries in anthesis appressed-ascending, in fruit more spreading, on pedicels shorter than bracts. PLATES 997–1000.

S. SYRTICOLA: Leaves oblong-ovate, acute or abruptly short-acuminate from well above the middle, the mature ones 3.5–9.5 cm. long; each margin with 81–137 (av. 105) horizontally or subhorizontally divergent and permanently gland-tipped prolonged often compound teeth; the mature petiole 2–10 (–15) (av. 6.3) mm. long, thicker than in the preceding; mature lower surface with secondary veins coarse and rather prominent: mature and larger stipules with 24–40 (av. 32) mostly gland-tipped and straight teeth on the longer margin: staminate aments in full anthesis subtended by leaves only about one-fourth grown; the oblong pale brown bracts with ashy-white to fuscous beard: pistillate aments in maturity 6–8 cm. long; flowers soon divergent, the mature capsules on pedicels nearly as long as to longer than blade of the oblong pale brown bract, the beard of the latter very long, ashy; style 0.7–1.5 mm. long. PLATES 1001 and 1002.

With such an abundance of distinctive characters, I find myself incapable of following Schneider in treating *S. cordata* (*S. adenophylla*) and *S. syrticola* as absolutely the same. Schneider states that the "styles . . . measure about 1.5 mm. in typical *S. adenophylla* [i. e. *cordata*], while they rarely are longer than 1 mm. in *S. syrticola*" (Schneider, Journ. Arn. Arb. i. 159). Rather naturally, however, my measurements of the style of *S. syrticola* accurately coincide with those of Ball in Deam's Shrubs of Indiana, 0.7–1.5 mm. I am not, as already emphasized, convinced that *S. cordata* (*S. adenophylla*) and *S. syrticola* are conspecific, although, as also noted above, at the northern border of the range of the latter some transitional specimens may possibly occur. So they do at the border-lines or coincident ranges of many willows. That is one of the reasons the willows are difficult; they *will* cross.

Incidentally, *Salix syrticola* has its greatest development on the dunes of Lake Michigan, especially toward the southern end of the Lake, a region famous for the isolation there of prevailingly

southern, rather than northern species. Although the dunes support *Pinus Banksiana* and a few other common Hudsonian and Canadian species, they are famous largely on account of the remarkable assemblage of far-isolated southern or southeastern species. These include *Aristida tuberculosa*, "Massachusetts to Georgia and Mississippi; around the southern end of Lake Michigan and in . . . Wisconsin, Indiana, Illinois", etc. (*Hitchcock*); *Panicum auburne*, "Massachusetts to northern Florida and Louisiana; Arkansas; Indiana, near Lake Michigan" (*Hitchcock*); *Eleocharis geniculata* (*E. caribaea*), Florida to Texas and southern California, north near coast to North Carolina, sands of Great Lakes, southern Ontario to Michigan and northwestern Indiana; *E. melanocarpa*, localized in northern Florida and Georgia, southeastern Virginia, southern New Jersey to southeastern Massachusetts, eastern Texas, and dunes of Lake Michigan; *Psilocarya nitens*, occurring from eastern Texas to Florida, thence north to southeastern North Carolina, otherwise highly localized in Sussex County, Virginia, Cape May region, New Jersey, Suffolk County, Long Island, Plymouth County, Massachusetts, and dunes of Lake Michigan; and so on to *Stachys hyssopifolia*, a very characteristic species occurring from southern New England and southeastern New York to South Carolina and isolated in southern Michigan and northwestern Indiana; or *Lycopus amplectens* Raf. (*L. sessilifolius* Gray), one of the most definite of species, occurring from Mississippi to Florida, thence to North Carolina, from southern New Jersey to southeastern Massachusetts, and among the dunes of Lake Michigan. In view of this striking southern, rather than prevailingly Hudsonian, relationship of the flora of the dunes of Lake Michigan, it is wise to hesitate before too positively asserting that *S. syrticola* of the dunes of Lake Michigan is, in spite of its many distinctive characters, identical with the shrub which prevails in the Hudsonio-Canadian area from Hudson Bay to southern Labrador and Newfoundland. Primarily upon *S. syrticola* which he misidentified with *S. adenophylla*, Schneider set up his § *Adenophyllae*, although, as quoted by me on p. 15, he admitted that he was perplexed "to draw a sharp line between [§ *Cordatae*] . . . and the [§] *Adenophyllae*". If *S. cordata* Michx. and *S. cordata* Muhl. are, as Schneider incorrectly says, identical, though clearly of the same section, and if, as it

seems to me, *S. adenophylla* is the same as *S. cordata* Michx. (not Muhl.), then § *Adenophyllae* Schneid. has a very slim basis for separation from § *Cordatae*.

The automatic abandonment of the later name, *Salix cordata* Muhl., not Michx., necessitates the following transfer:

S. RIGIDA Muhl., forma **mollis** (Palmer & Steyerm.), comb. nov. *S. cordata* Muhl., forma *mollis* Palmer & Steyerm. in Ann. Mo. Bot. Gard. xxv. 770 (1938).

S. RIGIDA Muhl., var. **angustata** (Pursh), comb. nov. *S. angustata* Pursh, Fl. Am. Sept. ii. 613 (1814). *S. cordata* Muhl., β. *angustata* (Pursh) Anderss. in DC. Prodr. xvi². 252 (1868).

Typical *Salix rigida* Muhl. has the leaves broadly rounded to subcordate or slightly cordate at base, one sixth to one third as broad as long, the mature blades 1.5–4.5 (av. 2.75) cm. broad. In var. *angustata* the blades taper to base or are very gradually rounded, one eighth to one fourth as broad as long, the mature ones 0.9–2.2 (av. 1.5) cm. broad.

2. ADDITIONAL NAMES AND TRANSFERS IN SALIX—

× S. **Jesupi.** *S. pameachiana* sensu Anders. in K. Svensk. Vet.-Akad. Handl. vi. 48 (1867), not Barratt (1840). *S. alba*, var. *pameachiana* Anders. in DC. Prodr. xvi.² 212 (1868), not *S. pameachiana* Barratt, basonym. *S. alba* × *lucida* Bebb in Gard. and For. viii. 423, 424, fig. 57 (1895).

Named for its discoverer, HENRY GRISWOLD JESUP (1826–1903). *Salix pameachiana* Barratt, Salices Amer. (1840) "growing about the Pameacha stream in this town [Middletown, Connecticut]" and, therefore, not a personal name as assumed by Andersson and by Schneider, who regularly used a capital initial, was said by Barratt to be "the intermediate of S. vitellina and the former [*S. decipiens* or *fragilis*]". Carey in Gray, Man. 428 (1848) treated it as *S. alba*, var. *vitellina* × *S. fragilis*. It has nothing to do with the very striking × *S. Jesupi*.

S. INTERIOR Rowlee, var. **exterior,** var. nov., foliis plus minusve persistenter sericeis breviter subacutis oblongo-lanceolatis dentibus suppressis, lamina 2–7 cm. longa ad 1.5 cm. lata.—Beaches of Aroostook River, MAINE: Caribou, July 18, 1902, *Williams, Collins & Fernald* (TYPE in Herb. Gray.; ISOTYPE in Herb. N. E. Bot. Cl.); Fort Fairfield, June 28, 1931, *Fernald & Weatherby*, no. 2432. PENNSYLVANIA: banks of Susquehanna River, above McCall's Ferry, York Co., Sept. 13, 1864, *T. C. Porter* (Herb. Phil. Acad.; fragments and tracing in Gray Herb.).

In its very short and broad leaves with suppressed teeth quite distinct from narrower-leaved typical *Salix interior*, in which the usually divergent teeth are prominent. *S. interior*, named for its extensive inland development, or its forma *Wheeleri* (Rowlee) Rouleau, extends from Alaska to Oklahoma and Arkansas, and eastward in the North to the St. Lawrence River in Quebec and the Connecticut in western New England, with a slight but isolated occurrence along the St. John in New Brunswick and the lower Restigouche in Quebec. Var. *exterior* is close to the easternmost edge of the specific range. Although the name *S. longifolia* Muhl. (1803) is still much used, it was clearly antedated by the wholly different *S. longifolia* Lam. (1778).

S. RETICULATA L., var. **semicalva,** var. nov. (TAB. 1003, FIG. 2–4 et TAB. 1004, FIG. 2–4), squamis masculis flavescentibus dorso glabris vel glabratis; antheris flavescentibus; squamis foemineis flavescentibus vel fulvis; capsulis sparse breviterque pilosis.—Limestone barrens and gravels, northern and northwestern NEWFOUNDLAND: Quirpon Island, *Wiegand, Gilbert & Hotchkiss*, no. 27,939; Cook Point, Pistolet Bay, *Fernald & Gilbert*, no. 27,936; Anse aux Sauvages, Pistolet Bay, *Fernald, Wiegand & Long*, no. 27,940; Sandy (or Poverty) Cove, Straits of Belle Isle, *Fernald, Long & Dunbar*, no. 26,586; between Nameless Cove and Mistaken Cove, straits of Belle Isle, *Wiegand, Pease, Long & Hotchkiss*, no. 27,935; Flower Cove, July 17, 1920, *Mary E. Priest;* Capstan Point, Flower Cove, *Fernald, Long & Dunbar*, no. 26,585; south of Flower Cove, *Wiegand, Pease, Long & Hotchkiss*, no. 27,934; Brig Bay, *Fernald, Long & Dunbar*, no. 26,587; St. John Island, *Fernald, Wiegand, Long, Gilbert & Hotchkiss*, nos. 27,937 and 27,938; Ingornachoix Bay, *Fernald & Wiegand*, no. 301; Gargamelle Cove, Ingornachoix Bay, *Fernald, Long & Fogg*, nos. 1578 (TYPE in Herb. Gray., July 20, 1929)—1580; Pointe Riche, *Fernald, Long & Fogg*, no. 1581.

The two collections (*Woodworth*, no. 143, and *Abbe & Odell*, no. 210), from the Torngat region of northern Labrador, have the pale bracts and the minutely puberulent ovaries of var. *semicalva*. I have seen no staminate material from that area.

Typical arctic-alpine *Salix reticulata* (PLATE 1003, FIG. 1 and 1004, FIG. 1) has the bracts of the pistillate aments dark (deep purplish to blackish), those of the staminate aments heavily villous at base on the back (as well as on the inner surface), the anthers dark (Schneider in Journ. Arn. Arb. iii. 92 (1921), in his key saying "Antherae violaceae" for *S. reticulata* as opposed to

"Antherae flavae" for *S. vestita*), the ovaries and capsules heavily white-tomentulose. The arctic shrub (especially in Eurasia) may often have silky pubescence on the young leaves, this persisting near the base of the leaf on the back; and in European (typical) specimens the peduncle is usually villous. The Newfoundland representative of the species is glabrous from the first or with the young peduncles only sparsely pilose. Its aments have yellowish-brown to fulvous bracts, these in the staminate aments only weakly pilose or promptly glabrescent, the anthers pale or yellow, while the pubescence of the capsules is so short and fine that the purplish color of the capsule is scarcely obscured.

(*To be continued*)

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Lythrum alatum in Maine.—On 10 Aug., 1945, Mrs. Cleora D. Adams of Hartford sent me for identification a plant that she collected on 8 August in Belgrade, Kennebec County. I determined it as Lythrum alatum Pursh, and Mr. C. A. Weatherby verified my finding. We thought that this might be its first known occurrence in Maine, but Prof. Fay Hyland writes me that he has it from Fryeburg, and Ralph Bean tells Mrs. Adams that he has collected it in Clinton.

Mrs. Adams gives this note on its location. "Growing in a patch 10–12 ft. across, noticeable from highway a few hundred feet away in damp meadow in bend where R. 135 leaves R. 11, before reaching cemetery which is on both sides of the road, and before R. 135 crosses R. 27.

"Three species of butterflies were working on the flowers: one black swallow-tail, several sulphurs, and several smaller ones which I think were pearl crescents".—John C. Parlin, Canton, Maine.

*Volume 48, no. 565, including pages 1–16 and plates 993 and 994, was issued 5 January, 1946.*

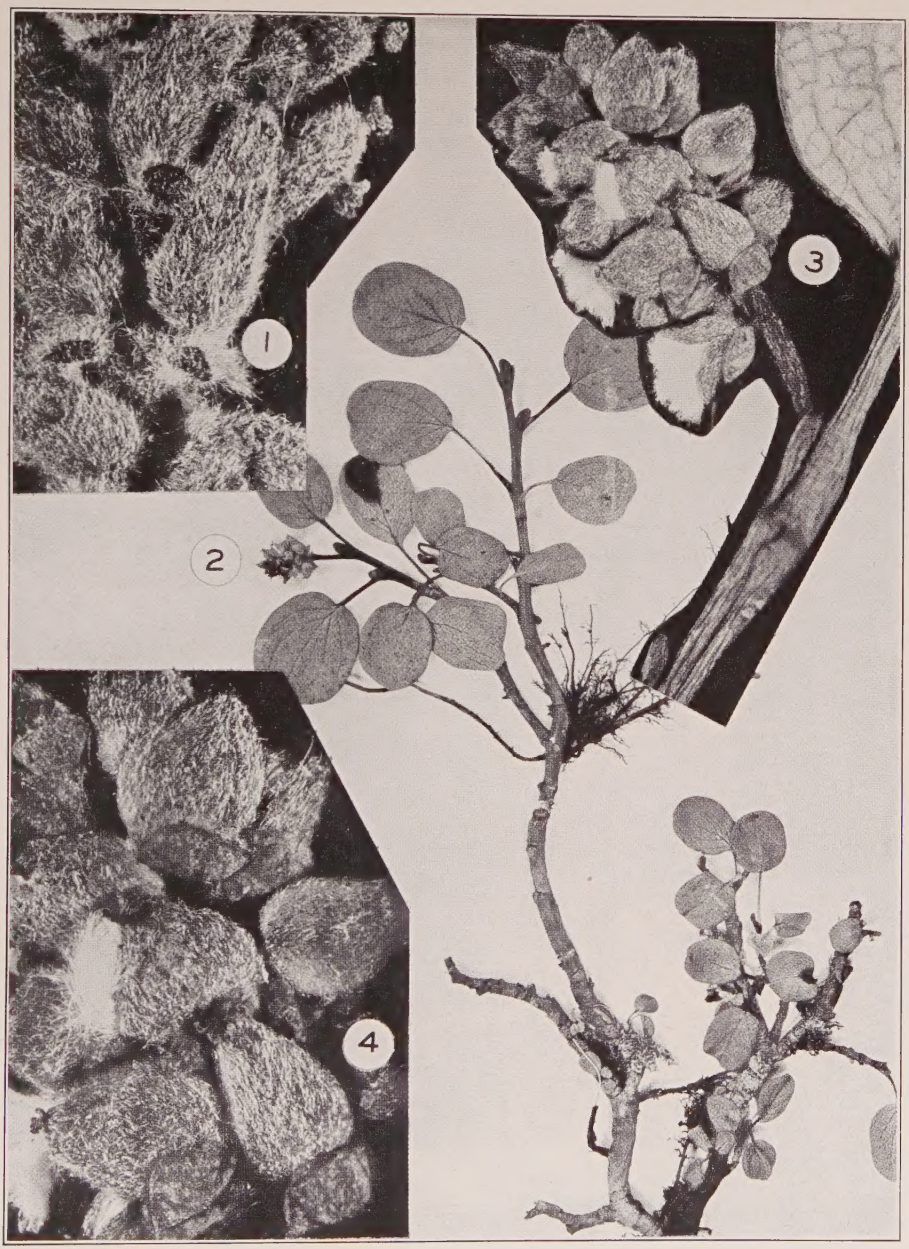


*Photo. B. G. Schubert*

SALIX RETICULATA: FIG. 1, portion of fruiting ament, × 10.
S. RETICULATA, VAR. SEMICALVA: FIG. 2, fruiting plant, × ⅘; FIG. 3, fruiting ament, × 5; FIG. 4, portion of fruiting ament, × 10.

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